

4220-CE-169
8/12/09 (aff)

Public Service Commission of Wisconsin

Eric Callisto, Chairperson
Mark Meyer, Commissioner
Lauren Azar, Commissioner

610 North Whitney Way
P.O. Box 7854
Madison, WI 53707-7854

August 4, 2009

Re: Northern States Power Company-Wisconsin, an Xcel Energy
Company, Request for Approval to Construct a Biomass Gasifier at
its Bay Front Generating Facility

4220-CE-169

To the Person Addressed:

Northern States Power Company-Wisconsin (NSPW) applied to the Public Service Commission of Wisconsin (PSC or Commission) for authority to construct, install, and place in operation at the company's existing Bay Front Power Plant (Bay Front) in Ashland, Wisconsin, equipment that will allow one unit of the plant to convert from coal burning to burning natural gas and synthetic gas (syngas) produced on-site from biomass for the production of electricity.

The four primary modifications made to Bay Front as part of the proposed project are:

- Installation of additional biomass receiving, storage, and handling equipment;
- Installation of a biomass gasification system;
- Modification of Boiler 5 to burn syngas and natural gas effectively to make steam for an existing turbine;
- Addition of enhanced flue gas filtering equipment to capture residual particulates.

This is a Type II action under Wis. Admin. Code § PSC 4.10(2). Type II actions require the preparation of an environmental assessment (EA) to determine if an environmental impact statement (EIS) is necessary under Wis. Stat. §1.11. An EA was prepared by PSC staff in consultation with the Wisconsin Department of Natural Resources (DNR). Based on the environmental review of this project, some relatively minor short- and long-term impacts would occur at and near the plant site. A potential for more serious and long-term ecological impacts and landscape changes is related to acquisition of the biomass for the gasification process. Because NSPW has not yet identified the specific biomass source areas where wood residues would be obtained or dedicated tree plantations would be established, these site-specific impacts can not be analyzed or described in a detailed manner in this EA. This would also be true if it is ultimately determined that preparation of an EIS is needed.

NSPW has identified the general area in which it expects to acquire biomass for the gasification system and has acknowledged the potential for serious impacts related to this process. It has outlined measures it would employ to avoid or reduce these adverse effects and some additional impact mitigation strategies are discussed in the EA. If these measures and strategies are implemented, a preliminary determination has been made that none of the expected impacts appear to have a significant environmental effect on the human environment. Therefore, preparation of an EIS for this project proposal is not required. Comments on this determination regarding the need for an EIS can be directed to the contact listed at the end of this letter.

The remainder of this letter briefly summarizes the major conclusions of the EA. To obtain a copy of the full EA, please request a copy from the contact person listed at the end of this letter.

Potential Construction Impacts

The project site is a brownfield site that is home to the existing Bay Front boilers, fuel storage, and associated facilities. Construction activities would involve demolishing an existing welding and maintenance shop, grading land, and erecting the gasifier facility and biomass handling facilities. NSPW's preliminary design includes a 1,500-ton storage building and a 7,000-ton outdoor storage yard. The new equipment to be installed for handling biomass fuel would include a scale, a new trailer hoist to empty truck trailers, and conveyor systems to deliver the biomass to the storage pile, storage building, and gasifier.

No impacts on protected resources are expected as a direct result of construction. There are no wetlands on the project site, and no natural plant communities or wildlife species in the area would be adversely affected. Noise and the dust effects would be ameliorated by existing berms and tree plantings east of the plant and the bluff to the south. The increased truck traffic would likely not be noticeable on U.S. Highway 2 and other transportation routes, except for very large equipment shipments.

Potential Operating Impacts

The new facilities would be compatible with the existing land use and would not change local agriculture, recreation, development plans, aesthetics, lighting impacts, odors, or other land uses in the immediate area. All biomass materials would be delivered to Bay Front by truck. NSPW anticipates an additional 25 to 40 trucks per day to deliver this fuel. Associated with biomass deliveries would be the potential for fugitive dust impacts. Dust could be released or present around the truck trailer dumping equipment and storage piles. Fugitive dust prevention generally involves covers over conveying equipment and some storage areas.

Air pollutant emissions from the operation of the fuel delivery trucks, gasification of the biomass, and combustion of the syngas or natural gas would be expected. Although no air permit has been issued or applied for, the emissions of criteria pollutants from the plant are all expected to decrease below the levels currently emitted from the combustion of coal. As the boiler fuel is shifted from coal to gasified wood, a 60 to 80 percent decrease in the emission rate of nitrogen oxide (NO_x), sulfur dioxide (SO_2), and mercury (Hg) is expected. Also, particulate matter 10 to 2.5 micrometers in diameter (PM_{10}) and particulate matter less than 2.5 micrometers in diameter ($\text{PM}_{2.5}$) are expected to decrease, as well as total PM. The stack for Boiler 5 is currently at about 40 percent opacity. With the project modifications, the opacity would drop to less than 20 percent.

NSPW states that the carbon dioxide (CO₂) emission levels related to Boiler 5 are expected to drop from current levels to a net level of zero. The company hopes that new forest regeneration or dedicated tree plantations grown in the biomass source areas could eventually sequester the same amount of CO₂ emitted during the combustion of gasified biomass.¹ This would result in a conceptual “closed loop” life cycle for the pollutant. The amount sequestered by the new plantations would depend on the health of the source forest or plantation areas and the effort made to ensure that the amount sequestered would be equivalent in carbon content to the amount consumed at the plant. There would be some CO₂ production from machinery operation related to the boiler and fuel handling.

Water quantity and quality in Lake Superior would be affected very little by the new facilities. The existing once-through cooling system would continue to serve the modified plant. The gasifier would not add to the cooling water quantity or change the cooling water quality. Erosion and stormwater runoff would be controlled, under DNR permit, so that the quality of Lake Superior water would not be affected.

There could be an increase in shared revenue for the city of Ashland and for Ashland County under the shared revenue utility aid formula. Also, the number of permanent employees at Bay Front is not expected to change, but the new construction could require additional personnel, who would likely come from the region.

Potential Impacts of Acquiring Biomass

Potential impacts of acquiring the biomass fuel for the gasifier would include the effects on forests and communities of removing the biomass, operating harvest equipment in the woods, and the air emissions and highway wear from truck transport of the fuel from the sources to Bay Front.

The proposed gasifier would consume up to 200,000 to 250,000 green tons of biomass each year, with around 100,000 tons of biomass supplied by primary wood products firms. Initially, the remainder of the fuel supply would be lower quality, underutilized materials that are typically left unharvested wherever logging for timber or pulpwood occurs. According to NSPW, these materials include treetops, logging slash, damaged trees, underutilized species like hemlock, tamarack, or cedar, and cull and mortality classed trees. The company assumes that biomass fuel could be brought in from an area up to 100 miles from the plant, but that most would be obtained from within 50 to 70 miles away. A substantial percentage of the forested land within a 50-mile radius is owned and managed by the U.S. Forest Service. For the long-term and a more reliable source of biomass fuel, NSPW states that it is exploring the feasibility of creating and maintaining biomass plantations, possibly through grower cooperatives.

¹ This neutrality is the subject of some disagreement in this case.

The main concerns about biomass acquisition relate to: (1) whether the harvest activities and the types and amounts of residue left behind in the woodland are appropriate to sustain the forest soils, future woodlands, and plant and animal habitat; and (2) the potential for harvested areas or dedicated biomass plantation systems to affect regional communities or the regional ecological landscape mosaic.

The Wisconsin Council on Forestry developed biomass harvesting guidelines in December 2008. These guidelines, which are few in number, are meant to be implemented in addition to any applicable silvicultural guidelines, forest management guidelines, and best management practices (BMP). In addition to providing some recommendations regarding the amount of coarse and fine woody debris to be left on-site, the guidelines cover harvest practices for site-specific situations such as areas with dry nutrient-poor soils, areas supporting rare or uncommon species or communities, areas with shallow bedrock, etc. However, because these guidelines are somewhat weaker than those in other states, including Michigan, Missouri, or Pennsylvania, there is some question as to whether they are sufficient to sustain the desired quantity and quality of woodlands in the state.

NSPW indicates that it would retain the ability in its contracts to show preference to those suppliers that obtain the biomass fuel in a sustainable way and to cancel contracts if the supplier does not adhere “to applicable biomass harvesting guidelines” or comply “with applicable managed forest plans or laws” of the state where harvesting is occurring. If this project is approved, the Commission could require NSPW to ensure that sustainable harvesting practices are used, rather than merely showing preference to suppliers that comply with the guidelines.

NSPW also suggested that it would harvest “underutilized” species like hemlock, tamarack, or cedar. There are some substantial problems with this practice. Because tamarack occurs on permanently saturated wetlands, it would be difficult to harvest sustainably under current Wisconsin BMPs due to our increasingly warm winters. Cedar and hemlock have value in creating wildlife habitat and aiding in forest regeneration and are restricted in harvest on state and federal lands, and Indian reservations.² If this project is approved, the Commission could consider restricting or limiting locations for the harvesting of residues depending on the ecological thresholds of the guidelines or other criteria. Also, potential source areas that involve vulnerable wetlands, protected species, or other ecologically important resources could be placed off-limits for biomass harvest.

With respect to the development of dedicated tree plantations, the Commission could require that they be established on existing open land, rather than prime farmland or existing forested lands, and that they be developed in context with local natural and community landscape features.

² Direct testimony of Professor David J. Mladenoff, PSC Reference #116944, p. 216.

Summary

In conclusion, the proposed project would cause some minor construction-related impacts at or near the Bay Front site and some long-term operational effects, such as additional truck traffic and the potential for fugitive dust during grading and fuel handling activities. Emissions of criteria pollutants, Hg, PM, and CO₂ would be expected to decrease.

The acquisition of the biomass fuel for the gasifier, if not conducted using sustainable forest practices, could cause long-term ecological landscape changes. However, the implementation and enforcement of harvest practices that would ensure long-term health of northern woodlands would avoid or greatly reduce the potential for serious long-term impacts. Similarly, a well-informed, cooperative approach to establishing dedicated tree plantations to supply biomass for the plant and to the efficient processing and transport of this fuel could avoid the potential for long-term adverse impacts on northern Wisconsin forests and communities. NSPW has stated its intent to use the contract process to ensure that the biomass residues it needs for the new gasifier are harvested in a sustainable manner and to work toward the establishment of plantations to supplant the need for harvesting wood residues.

If these commitments and other mitigation strategies described above are required by the Commission, it is unlikely that this project would result in significant environmental effects on the human environment, as described in Wis. Stat. § 1.11. Thus, preparation of an EIS for this project proposal is not required.

Comments on the finding of no significant impact for this proposed project should be made to Kathleen Zuelsdorff at the Public Service Commission of Wisconsin, by telephone at (608) 266-2730, or by e-mail at kathleen.zuelsdorff@psc.state.wi.us. Requests for an electronic version of the EA that has been prepared should be made to Kenneth Rineer by telephone at (608) 267-1201, or by e-mail at kenneth.rineer@psc.state.wi.us. Requests for a paper copy can also be accommodated if an address is provided. Comments must be received by Wednesday, August 19, 2009.

Sincerely,

Kathleen J. Zuelsdorff

Kathleen J. Zuelsdorff
Environmental Analysis and Review Coordinator
Gas and Energy Division